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CONTENTS

Can Psychological Research Be Planned on a National Scale? ROBERT B. MACLEOD 177

Psychology from the Standpoint of a Psychiatrist: CLARENCE M. HINCKS 192

Generalization and Central Tendency in the Discrimination of a Series of Stimuli: B. R. PHILIP 196

Studies in International Morse Code. IV. "Codent"—Signal Training Selection Test: JOSEPH E. MORSH AND A. F. B. STANNARD 205

The Syracuse Case Study Tests: DOUGLAS E. SMITH 210

Book Reviews 214

News and Notes 218

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Canadian Journal of Psychology

CAN PSYCHOLOGICAL RESEARCH BE PLANNED ON A NATIONAL SCALE?

ROBERT B. MacLEOD
McGill University

POSSIBLY NO SCIENCE has a less enviable record of haphazard, hit-or-miss research than has psychology. A research well planned is a research already half completed. This principle has been amply demonstrated in the history of individual researches. It applies equally well, however, to research planned and conducted by groups of scientists. The most impressive example is, of course, the war-time attack on problems of nuclear fission, which required a degree of planning and co-operation hitherto unknown in science. The study of cancer is now a planned enterprise; and so is the study of tuberculosis, of poliomyelitis, of soil conservation, of petroleum by-products, of insect pests. Scientific research is no longer a leisure-time activity, to be governed by the whim of the eccentric scientist.

Science has presented society with the machinery for its own destruction. Whether or not society is to survive will depend in large part on the science of the future. A note of urgency has been added. Research is now a duty, not a luxury; and that duty falls heavily on the shoulders of the psychologist. The psychologist cannot escape the sober realization that the present threat to man's survival arises from man's inability to cope with the forces of nature which man has released. Human decisions, human attitudes, human motivation—upon these will rest our survival or our annihilation. And we know so little about them! Can psychology rise to the challenge? Can we begin to think of research as a social obligation, as a kind of activity which we as individuals with special aptitudes and special training owe to our fellow-men? Can we make a concerted effort to envisage clearly the problems which must be solved if we are to survive as a human society? Can we, in short, plan psychological research on a scale commensurate with the needs of today?

The Canadian Psychological Association, through its Research Planning Committee, is attempting to answer this question. Aided by a grant from the National Research Council, the Committee has undertaken a systematic exploration of the major problems which invite psychological research in Canada, and of the research resources of Canadian psychology. It is hoped that research planning on a national scale will become a continuing function of the Canadian Psychological Association, and that it

will serve to stimulate, to facilitate, and to focus on genuinely important problems the research activities of Canadian psychologists.

The following is a revision of a statement prepared by the writer for the Research Planning Committee as a basis for preliminary discussion. It is not expected that the work of the Committee will conform to the pattern here presented, but it is hoped that the publication of this statement will stimulate specialists in the various fields to undertake more detailed analyses.

When we speak of planning on a national scale, the emphasis on the term "national" is a mere accident of social organization. For the most part, the basic problems of psychology are non-national in character. There can be no fundamental psychological fact or principle the implications of which do not extend beyond the nation. Since the nation is one of the dominant units of social organization, however, it becomes a convenient unit for research planning. There can be no Canadian psychology as such, but the fact of Canadian national organization creates psychological problems which must be defined in Canadian terms and attacked with the human and material resources of Canada. In spite of its geographic size, Canada is a small nation. Its very smallness presents the possibility of the development of a balanced research programme, geared to the needs of the nation, which might be unique, and which might eventually point the way towards research planning on an even larger scale.

If we are convinced that psychology has an important contribution to make towards the solution of the problems that face the nation we must see to it that our resources are properly used; and this means that we must clarify our thinking as to what we can and ought to do. There are two approaches, both of which must be followed: (a) the academic approach, and (b) the practical approach.

(a) From the academic point of view we must take a fresh look at our science in its present state of development, re-examine the persistent problems which it is attempting to solve, assess the degree of progress we have made towards their solution, evaluate the techniques which we have developed, try to decide where the pressure for new research ought to be applied, and then do everything possible to formulate and support research programmes designed to fill the gaps. This is without reference to the practical application of the results; for the history of science shows that the mere concern for practical application has not always led to the most practical scientific developments. This kind of planning is a legitimate function of the Canadian Psychological Association. The Association should see to it that the various research departments in Canada are never at a loss for suggestions as to worth-while projects and for support in their development. The Association should also see to it that every important branch of psychological research is represented somewhere in Canada. In

the event of another national emergency, which suddenly calls for specialized knowledge and specialized skills, the Association should be able to point at once to the place where the equipment is available and to the man who can be requisitioned for the emergency job.

Glancing out from the ivory tower of academic psychology, we can ask the question: In what ways can our knowledge and our specialized skills be of use to the nation? More specifically, What can we do in a practical way with our psychology of perception, with our psychology of learning? Of what practical use are the techniques of the social psychologist, of the animal psychologist, of the student of the psychology of language? During the recent war the resources of psychology were inadequately used, partly because those in authority simply did not know what psychologists *do* know and *can* do, but also because the psychologists themselves had not until too late thought through the full practical implications of their own science. During the war psychologists played a notable role in the development of military programmes of selection and training. But psychologists should have done much more. Camouflage, black propaganda, prisoner interrogation—these are but a few of the fields in which the potential contribution of the psychologist was never fully appreciated.

Thinking of peace rather than of war, and of enduring problems rather than of emergency problems, one feels the same challenge. It is quite as important now as it was during the war that psychologists scrutinize their specialized knowledge and specialized skills, and try to think of ways in which these can be put to the service of the nation.

(b) The more immediately practical approach is to survey the Canadian scene, to select those national problems in which the importance of the human factor is most evident, to determine ways in which available psychological techniques can contribute to their solution, and, where necessary, to design new techniques. This kind of planning should ideally be conducted jointly by psychologists who know the resources of their science, and representatives of government, who can see in better perspective the needs of the country. Rather than wait, however, until the necessary high-level liaison has been established, it would seem wise for the psychologists to attempt their own preliminary assessment of the national situation and to present a provisional list of ways in which psychological research can be of service to the nation.

The following list of problem areas is presented as merely one of many possible ways of analyzing the situation. In this first analysis, in the case of each problem area, what seem to be some of the most pressing sub-problems are indicated without regard to the availability of adequate research techniques, trained personnel, and funds.[1] The overall analysis

[1]No attempt at documentation has been made. Relevant bibliographies are appearing regularly in the psychological periodicals, especially the *Psychological Bulletin* and *The American Psychologist*. Systematic bibliographic work is, of course, prerequisite to any planned research.

should be corrected and the revised list of problems then ordered in terms of urgency and feasibilty of research. In connection with almost every area for research the sub-problems tend to break themselves down into four categories: (1) *spot assignments,* e.g., the application of a standardized test for the purpose of supplying some needed facts; (2) *spot problems,* e.g., the construction of a new kind of test or the study of the psychological effects of a particular drug; (3) *methodological research,* directed toward the design of new techniques which may later be applied to specific problems; for example, the development of indices of civilian morale; and (4) *basic psychological research,* e.g., in such fields as perception, motivation, and social attitudes, the results of which will be formulated as fundamental psychological principles capable of universal application. It is to be hoped that the emphasis in Canadian psychology will be on problems of the third and fourth categories. Psychology has not yet progressed far enough to rest content with established principles and methods. The psychologist cannot afford to lose his war-generated sense of urgency. But that very sense of urgency should now push him into fundamental research.

1. *Problems of National Defence.* This category is placed, without apology, at the head of the list. A concern about national defence does not imply a desire for war. The broadened concept of defence research must include far more than the preparation for a possible war emergency. Indeed if the concern is truly about the defence of the nation, its main focus in peacetime must be on the avoidable conditions which contribute to war, on intelligent alternatives to war, on those elements of strength and weakness in the nation which must be understood if the nation is to assume its proper place in a peaceful world. Research in nuclear physics is defence research, not merely because it will produce more devastating weapons, but far more significantly because, if its results are intelligently controlled, it will raise the material standard of living and correspondingly eliminate some of the causes of unrest. In the same way, psychological research directed towards national defence can and must be concerned with the discovery of principles and techniques which can be applied in other than military contexts. In the broad sense, all the psychological problems discussed here are problems of national defence. In this section are listed merely those which define themselves in terms of wartime requirements. It will be seen, however, that no basic finding will be limited in its applicability to the wartime setting.

(a) *Selection.* Existing methods of screening large numbers of individuals, based on tests of general capacities, special abilities and aptitudes, and gross personality characteristics, have proved fairly adequate, and the main lines for continued research have been laid down. The immediate need is for emphasis on specialized selection. The increasing com-

plexity of the military establishment parallels the increasing complexity of society. Men are becoming less and less interchangeable. The differing requirements for aircraft pilots, supply officers, ordnance technicians, and paratroopers are not merely differences of intelligence, educational level, or physical vigour. They do not fit the neat categories of existing standardized tests. Psychological research, if it is to meet future needs, must attack the "intangibles" of personality—whatever is meant by courage, leadership, personal responsibility, frustration, tolerance, loyalty, discipline, ambition—and translate its findings into tests which can be used for the assessment of men. The methods developed in England by the War Office Selection Board and in the United States by the Office of Strategic Services, combining as they did the standardized psychological test, the miniature life situation test, and the clinical interview, represent merely a promising beginning. The major task still lies ahead.

(b) *Training,* like selection, is a field in which the psychologist has already made a substantial contribution and in which further developments in the psychology of learning will continue to be of practical value. The constructiveness of this research will depend in large part on the extent to which the requirements of new specialized skills become known. Viewed as a whole, however, the problem of training involves more than the teaching of special skills. Inherent in what is usually referred to as "military discipline" is the whole problem of ideological indoctrination. The soldier is not merely a part of a fighting machine. He is a public servant, a representative of his country and of his culture. The traditional conception of military discipline as ready and unquestioning obedience to authority can no longer be maintained. In the modern world military action is only one phase of warfare. The soldier who has no understanding of the values inherent in his culture is not equipped for his job. A democracy cannot afford to have in its army men who have not incorporated in themselves the basic attitudes of democracy. Thus the problem of military training becomes in its broader aspects the problem of educating the whole man. The authoritarian regimes have demonstrated all too clearly the military effectiveness of ideological indoctrination. Their success should serve as a challenge to the democracies.

(c) *Maintenance of troop morale.* "Morale" is a dangerous word, since it suggests the existence of a simple entity which can be pigeon-holed and studied. There is no such entity. The study of morale means a study of all the conditions which contribute to or detract from the full psychological identification of the individual with the enterprise with which he is formally identified. Such a study must include within its range everything from the deepest problems of motivation, basic goals and values, to the effects of incidental conditions of living, such as quality of food and housing. It can lead to no simple rules of thumb for morale maintenance;

for the morale of any unit will necessarily be a function of circumstances peculiar to that unit. The morale problems of combat troops differ from those of service troops, those of a peace-time army from those of a war-time army. In the last analysis an adequate morale programme will depend on a complete understanding of the psychological characteristics of the soldier; and this in turn will depend on a continuing psychological study both of the troops themselves and of the populations from which they are drawn.

More specifically, however, two types of research are urgently needed. (1) We must have efficient indices of morale, which will facilitate the recognition of morale-strengthening and morale-weakening conditions. This is partly a methodological problem, involving studies in small-sample statistics, the relative values of written questionnaire and interview, the accuracy of officer estimates, etc., partly a problem in basic psychological research, involving the attempt to reduce to psychological terms the most significant motivational and attitudinal conditions of good and bad morale. Since morale problems can never be fully anticipated, we must (2) design in the light of these studies a programme of selection and training for morale officers.

(d) *Maintenance of home front morale.* This is in many respects even more important than the problem of troop morale. The authoritarian regimes have endeavoured through regimentation and terror to render civilian morale irrelevant to a war effort. The success of the Nazis in this respect was impressive. Such a solution would be self-contradictory in a democracy. A democracy can sustain its effort only through the willing participation of its citizens.

The pattern of research in this field is similar to that for (c) above. We require (1) a psychological analysis of the significant variables in civilian morale, with particular attention to the effects of bombing, food shortages, etc., (2) a critical study of the various techniques of measuring morale, e.g., polls, small-sample intensive interviews, correspondence panels, rumour clinics, etc., and (3) a design for the training of civilian leaders for emergency conditions.

(e) *Psychological warfare* has as its target the morale of the enemy, and consequently depends for its effectiveness on morale research. From a purely technical point of view, the various methods of psychological warfare, e.g., open radio propaganda, "black" radio, surrender leaflets, rumour planting, need to be assessed. Questions of content, timing, particular population target, etc., should be studied in the light of our recent experience. In broader perspective, however, we must recognize psychological warfare as merely a military illustration of a process that is now going on in mounting tempo on an ever increasing scale—the process whereby people are induced by psychological means to conform to the will of others.

An understanding of all that is cloaked by the word "propaganda" is necessary for the defence of the values in which we believe.

(f) *Intelligence.* In a military organization this is the function of procuring and interpreting the information necessary for the planning of strategy and the selection of tactics. The role of the psychologist in intelligence work has never been clearly defined. There are, however, many inviting problems for research. To what extent, for instance, can our knowledge of methods of interviewing be applied to the interrogation of unwilling subjects, e.g., prisoners of war? Can the methods of sampling statistics be applied to the analysis of censorship intercepts? Is it possible to devise a morale index for an enemy population, based, for example, on the analysis of enemy propaganda? Can the analysis of a culture provide the basis for an accurate assessment of the psychological strengths and vulnerabilities of a nation? Will an understanding of the personality structure of an enemy general enable us to predict the kind of strategy he will work out or the kind of tactic he will employ?

(g) *Operations.* Quite apart from problems of morale, every military operation involves problems of a psychological nature. Sensory thresholds, eye-hand co-ordination, motor efficiency, susceptibility to fatigue, decision time, etc., may be affected by a variety of conditions. Extensive studies have already been made, for instance, of the effects of oxygen deprivation, in connection with high altitude flying. Further work is needed on the psychological effects of varying diets, of noise (in tanks), of extremes of temperature, etc. Canadian psychologists should, for obvious reasons, be expert in the field of Arctic operations.

(h) *Research and development.* All too frequently the development of a new weapon or instrument proceeds without adequate regard to the limitations of the man who is to use it. An instrument panel in an aircraft, for instance, may be technically perfect, but may be inefficiently designed from the point of view of the pilot. A range-finder which synthesizes nineteen different variables may neglect a human variable which may ruin the accuracy of the whole instrument. The human factor must be considered in the design of every weapon or instrument in the use of which human beings participate.

2. *Problems Connected with the Organization of Industrial Life.* The industrialization of a nation always creates special psychological problems, not merely in the manufacturing industries, but also in agriculture, in the mines, forests, and fisheries, in every segment of life in which work is being specialized and man and machine are being co-ordinated to each other. Industrialization means a fundamental change in the pattern of a culture. To the extent to which man has grown into the pattern of his culture, man must undergo a corresponding revolution in his psychological make-up when the culture has been radically altered. One of the tasks of the social

sciences is to write the social history of industrialization in Canada. A significant chapter of this history will have to be written by the psychologist.

Of greater urgency, however, are the practical problems which emerge within the context of industrial operations. Many of these have already been successfully attacked. Psychological methods have proved their worth in the selection of employees, in the analysis and evaluation of jobs, in the elimination of accident hazards, in the evaluation of incentives, and in a host of other situations in which efficiency is dependent on the human factor.

For the most part these have been centred about the adjustment of the man to the machine. One of the effects of the war, however, has been to some extent to invert the emphasis. In a situation in which labour supply is short, and the demand for production is insistent, the industrial machine has had to be adjusted to human requirements. The work of the industrial psychologist is consequently becoming more truly psychological. He can no longer consider human material as expendable, but must concern himself rather with the needs of human beings which must be met in an industrialized society. This inversion of the problem invites new types of research. The problem of machine-design, for instance, becomes partly a psychological problem, to be attacked jointly by the psychologist and the engineer. The problem of incentive must be viewed in the light of a complete psychology of motivation, which probes the meaning of security, anxiety, and happiness. The whole problem of labour-management tension becomes psychologically that of discovering ways of establishing communication between groups with immediately conflicting but ultimately common interests. Industrial psychology has begun as an applied psychology of the individual; it must grow into an applied social psychology.

3. *Problems Arising from the Diversity of Cultural Groupings.* The population of Canada includes as wide a variety of peoples as can be found in any major country. In addition to the readily identifiable groupings based on national origin, language and religion, there are innumerable less distinct sub-groupings, distinguished by sectarian allegiance, political affiliation, occupation, income, and other organizing factors recognized in sociological analysis. There are cultural values to be derived from such a diversity. The practical problem is how, without sacrificing this diversity, to maintain national unity.

This is, in the first instance, a problem for the sociologist. Within the context of a developing sociological analysis, however, the social psychologist will find challenging problems for research. The broadest and most fundamental of these is that of developing a methodology which will render possible the psychological analysis of a culture. The need for such a methodology was acutely felt during the war, especially in connection with

the planning of psychological warfare. Enough exploratory work was done to demonstrate that the task is not a hopeless one; but systematic work has barely begun. The differentiating characteristics of groups, as expressed in their patterns of social organization, their literature, their mythology, etc., are carried in the individual as traits, habits, explicit and implicit attitudes, goals, and values. The methods which we have developed for the study of the latter must now be revised and adapted to the requirements of the larger problem.

Even without a new methodology, however, there are pressing problems which can be attacked with available tools. Under what conditions, for instance, does a truly psychological membership in a sub-group come into existence, and what forces shape its further development? This is a problem for child study. At what points do divergences in attitude and value become significant as causes of inter-individual and inter-group tension? What kinds of psychological sub-group membership conflict with national group membership? What are the psychological characteristics of a minority group attitude, and how do these vary from group to group? Under what conditions do linguistic differences constitute an effective barrier to understanding? What is the effect of bilingual training on psychological group membership? Such problems must all be solved if we are to maintain national unity; yet the available psychological knowledge is appallingly meagre.

4. *Problems Arising from Canada's Relations with Other Nations.* Most of the problems in this field are social-psychological in nature, involving the same conceptual framework and requiring the same techniques of investigation as do those arising from the facts of cultural diversity.

Canada is a member of the United Nations organization which is faced with the task of establishing communication and co-operation among groups which differ widely not only in language, as formally defined, but also in customs, in modes of thought, and in basic values. Canada, with its history of successful maintenance of national unity in spite of cultural diversity, might well be considered a sort of social laboratory for the United Nations. Canada has functioned as a democratic unit in spite of the barriers of language, religion, regional allegiance, and political ideology. The tensions which now threaten Canadian unity are fundamentally the same tensions as those which jeopardize the United Nations organization. A psychological analysis of the Canadian scene might well yield results which could help to illuminate the international problem. The situation suggests the desirability of a comprehensive research programme, planned in conjunction with the United Nations Educational, Social, and Cultural Organization and conducted jointly by social psychologists, sociologists, and social anthropologists. Such a programme would have to be long-range in character, involving initially a good deal of methodological re-

search. It should ideally be parallelled by similar programmes in other countries.[2]

The usefulness of psychological research as a partial guide to the determination of foreign policy has never been adequately explored. It is an inescapable fact that the foreign policy of a government will directly or indirectly affect the life of every citizen. Without arguing, one might safely suggest that every policy decision should be enlightened by the fullest possible knowledge of the attitudes and concerns of the citizen. What, for instance, are the attitudes of Canadians towards Russia, the United States, the United Kingdom, the other nations of the Commonwealth? How are these distributed in terms of region, religious affiliation, socio-economic status? How are they related to the character of the information made available (e.g., through newspapers, movies, school instruction)? With what degree of tenacity are they maintained? Such questions cannot be answered with precision by means of the ballot box, the "expert" observer, or even the conventional opinion poll. Nevertheless, the policy-maker is required to give answers, even if they be little more than guesses. The challenge to the social psychologist is to develop methods of getting behind the artificially crystallized opinions reflected by the ballot box and the poll, of probing the inarticulate attitudes, anxieties, hopes and allegiances which really govern behaviour. Recent developments in survey methodology and in sampling theory hold out considerable promise.

5. *Problems Connected with the Maintenance and Improvement of Political Democracy.* The use of survey methods as an adjunct to foreign policy determination raises the whole question of the role which psychological research might play in the improvement of the methods of democratic government. The use of psychological methods of selection in the Civil Service, at least on the lower occupational levels, is already well established, and may be expected to develop further. How high in the administrative and diplomatic hierarchy these methods can be applied is a question for speculation.

Important as is the problem of selection, however, there are even more fundamental questions about which the psychologist should think. How can effective communication be maintained between the representative and his electorate? Can problems of policy be reduced to terms which are meaningful for the average citizen? Will the development of survey methods create the dangers inherent in any government intelligence service? What are the basic characteristics of democratic and anti-democratic attitudes, and under what conditions do they develop? Are

[2]A proposal of this nature has been prepared by the International Committee of the Society for the Psychological Study of Social Issues at the suggestion of the secretariat of the Economic and Social Council. It will in due course be submitted to UNESCO.

there limits to the size and complexity of the social structure with which the individual can maintain a feeling of personal responsibility and personal participation?

These are not neat problems for research, but if the psychologist does not attempt to translate them into questions which can be answered by research, he will have failed in his duty. The problem of freedom versus regimentation is basically psychological. The psychologist must help to find the answer to the fascist and communist appeals.

6. *Problems of Immigration and Relocation of Populations.* Canada's immigration problem is a small part of a continuing world problem which the war has merely rendered more acute, namely, that of resettling and readjusting populations dislocated as a result of political, social, and economic change. The problem will always have to be approached from a dual point of view, requiring on the one hand analyses of the characteristics of the dislocated populations, and on the other hand of the potential recipient countries. A successful relocation should result in a fairly rapid assimilation of the new population to the existing social and economic structure. History provides innumerable examples of successful and unsuccessful relocations; and the problem is momentarily highlighted by current developments in India, in Palestine, and among the residually displaced in Western Europe.

It is not the task of the psychologist to determine Canada's immigration needs. Given an overall statement of these needs, however, e.g., in terms of number, occupational category, and prospective location, the psychologist should be able to translate them into terms of psychological requirements, and then to develop the appropriate techniques of selection. When the problem is envisaged in all its dimensions it is clear that such a selective procedure cannot be limited to the conventional tests of capacity, ability, and skill. The assimilability of people depends also on less readily measurable characteristics of personality, e.g., rigidity of attitudinal framework, degree of prejudice, value structure. With improved techniques for the assessment of people it is not inconceivable that mobile assessment teams might eventually be despatched to operate in areas from which immigrants come.

The development of such a psychological service will necessitate, however, a considerable extension of our present knowledge. We know little as yet about the psychological problems of assimilation. The studies of racial and national differences must be broadened to include "culturally determined" as well as "biologically determined" differences. Even the traditional problem of the inheritance of psychological characteristics, which has fallen somewhat into disrepute, must be revived and reformulated.

7. *Problems of General and Specialized Education.* These require little comment. The place of psychological research in the development of educational theory and practice is now assured, and educational psychologists have laid a firm basis for further research. There are two general trends in current educational thinking, however, which deserve special emphasis when we view the problem in national perspective. Education from the viewpoint of the nation is the process whereby society creates its citizens. Broadly considered, the central subject matter of educational psychology is still the problem of learning. But it is learning conceived, in the first place, as a developmental process involving the whole person; in the second place as a process which continues throughout life. Educational psychology becomes then the applied psychology not only of cognition and motor performance, but also of motivation, of attitude formation and change, and of social adjustment. The psychologist must build a science which can be applied not only to formal instruction in the schools, but also to home training, vocational guidance for both child and adult, the direction of community educational enterprises, and the planning of leisure-time activity.

8. *Problems Arising from the Changing Function of the Family and the Changing Role of Women.* With the changing pattern of institutional living in our society, the institution of the family is relinquishing many of its traditional functions. The fact has been the subject of endless discussion, but the attendant psychological problems have received much less attention as topics for research than their importance warrants. In this field the psychologist has not kept pace with the sociologist and the social anthropologist.

Most of the problems which invite investigation fall into two broad categories, those concerned with the child and those concerned with the woman. Only a few of these need be mentioned. It is, for instance, a frequently quoted, but not yet verified, thesis that the first few years of life determine the main trends of the personality. Anthropological studies suggest that differently patterned cultures yield widely different personality types. Since in our culture the family is the dominant institutional influence during the first few years, it is imperative that such broad generalizations be tested by detailed study. With the available knowledge of our own social structure, and our technical resources for personality analysis (mental tests, projective techniques, methods for the study of group dynamics, adaptations of the clinical interview, etc.), we should be able to scrutinize in a way impossible for the anthropological field worker the relationship between personality development and the widely varied types of family structure contained in our culture. Only through detailed investigation of this sort can we finally assess the psychological significance of the loss of fixity of location in urban living, the reduction in family

size, the partial withdrawal of the mother through outside employment, the day-nursery as a substitute for the home, and so forth. Through such investigations, too, we may eventually be able to approach the examination of psychoanalytic theory with facts rather than with alternative speculations.

It seems ridiculous that 50 per cent of the nation's adult population, the women, should be considered as a psychological problem. And yet the fact is that women as a group are in danger of slipping into the category of psychologically displaced persons. The violence of the current controversies, the vigorous attempt of the Nazis to return women to the home, the rise in alcoholism among women—these are merely indications that the problem is a real one, and still unsolved. It is not the task of the psychologist, as psychologist, to plunge into the combat for woman's rights, or to pass judgment on the various schemes that are being currently promoted, e.g., community kitchens designed to relieve women of household responsibilities. As in the case of any other group problem, the duty of the psychologist is to determine the relevant facts. The whole problem of sex differences must be taken out of the realm of special pleading and re-assessed in a dispassionate way. The hypotheses of the psychoanalysts and the anthropologists must be scrutinized with the aid of the best available experimental and statistical tools. The oscillations between hereditary and environmental determinism, too frequently governed by fashion, must be stopped, and replaced by careful psychobiological investigations in controlled and systematically varied situations. The social psychology of minority group attitudes and of attitudes towards minority groups must be extended to include the attitudes of women towards men and of men toward women. Psychological investigation cannot solve the whole problem, but without psychological investigation it cannot be solved.

9. *Problems of National Health.* The practical problems, insofar as they concern the psychologist, usually present themselves in connection with the diagnosis and treatment of the misfits in our culture, the feeble-minded, the delinquents, the criminals, the vagrants, the neurotics and the psychotics. These will continue to be with us, and there should be no diminution of the research into the psychological characteristics of these special groups. The more fundamental psychological problem, however, is epitomized in the central purpose of the Mental Hygiene Movement, namely, that of securing mental health. What are the laws which govern the development of a really healthy personality? It is here that psychological research should lay its greatest emphasis.

The professional opportunities in clinical psychology are multiplying so rapidly as to warrant justifiable concern on the part of the scientific psychologist. There are serious dangers inherent in such a mushroom

growth. In the first place, psychologists are running the risk of "overselling" their science, i.e., of giving promises which cannot be fulfilled in the present state of our science. Granted that the psychological clinician can even now assist materially in the diagnosis of mental abnormalities and in the clarification of cases which are not labelled as abnormal, he is nevertheless limited to the application of certain elementary and imperfectly developed testing techniques and to whatever insights his general psychological training may yield. However valuable such services may be, and their value is attested by the current demand for them, they represent but a small fraction of the service which the psychologist will ultimately be able to provide. A premature application of our present meagre knowledge may result in the "freezing" of clinical psychology on the level of a technical service ancillary to the medical profession.

The second, and more serious, danger is to the science of psychology itself. The current popularity of "psychosomatic medicine" is merely one indication of the extent to which the psychological point of view has finally won acceptance in medical circles. This success is due, however, less to the careful research of scientific psychologists than to the spectacular, and frequently incautious, forays of Freudian analysts into psychological theory. This is not the place for an evaluation of the Freudian contribution. It must be recognized, however, first, that the Freudian thoery is derived primarily from a consideration of clinical, i.e., abnormal, cases, and, secondly, that plausible diagnoses and spectacular cures do not in themselves establish a theory as valid. The methods of science are slower and less dramatic. There is a real danger, consequently, that clinical psychologists may not merely tie themselves to the coat-tails of the medical profession but also absorb into their thinking the biases of the clinical practitioner.

The argument here is not *against* the application of psychological knowledge to clinical practice, but *for* an increased emphasis on basic research on the psychological processes of the normal person. The deviant population of the psychological clinic should not be allowed to define the conceptual framework within which normal people are understood. The psychologist has too frequently disregarded the Freudian and other clinically oriented theories as unscientific. He should rather accept them as a challenge to scientific research, not for the purpose of refuting them but for the purpose of completing the picture. We need a psychology of personality which is derived from the study of normal people. For every case-history of a person who has "gone wrong" there should be a score of case-histories of people who have "gone right." It is on the basis of these—not merely of college sophomores, but of people of varied characteristics selected in terms of sampling principles—that we should investigate the laws which govern the direction and regulation of behaviour. A

research centre for the study of normal people is less easy to organize than is a psychological clinic in a mental hospital; yet until we have such centres we shall not be able to make our proper contribution as scientists to the cause of mental health.

Conclusion. The foregoing analysis makes no pretence to completeness or to freedom from personal bias. It is presented in the hope that others will be stimulated to correct its errors or provide alternative analyses. Even from a sketchy survey such as this, however, three points emerge clearly: (1) Many of the most urgent of our national problems are also problems for the psychologist; the psychologist can and should contribute towards their solution; (2) Even in its present undeveloped state, psychology possesses knowledge and techniques which can be immediately and usefully applied to the solution of national problems; but (3) The really important contributions cannot be made until psychology as a science has advanced further. Every national problem which we have considered demands for its final solution techniques, knowledge, and understanding which we do not yet possess. The great need now is consequently for basic research, research which goes beyond the immediately practical but which will eventually yield a profound understanding of man. This will ultimately constitute psychology's most important contribution.

ANNOUNCEMENT REGARDING C.P.A. FEES

The Secretary-Treasurer of the Canadian Psychological Association announces that as a result of the mail ballot sent to all Members and Fellows of the Association in October, approval was given to the following resolutions:

(1) "The annual membership fees for all classes of members shall be determined from time to time in accordance with Association needs, on recommendation of Council, by mail vote of the Fellows and Members of the Association."

(2) Adoption of the following scale of fees effective beginning January 1948:

Fellows and Members—$5.00

Associate Members —$4.00

Fees are to include a $3.00 subscription to the *Canadian Journal of Psychology.*

PSYCHOLOGY FROM THE STANDPOINT OF A PSYCHIATRIST[1]

CLARENCE M. HINCKS
General Director, National Committee for Mental Hygiene (Canada)

IT IS A GREAT PLEASURE to join you at this afternoon's session, and to be given the opportunity of conveying to your newly organized Ontario Psychological Association the greetings and best wishes of the National Committee for Mental Hygiene (Canada).

I share with you a sense of deep satisfaction because of the circumstance that psychology is now taking its rightful place as one of the major sciences, not only on university campuses, but also in the great world of human affairs. Yes, psychology is coming of age; and the formation of your new Association is symptomatic in this regard. As you psychologists grow in numbers, as you make your contributions in varied settings, as you contemplate new fields for psychological endeavour, as you conduct research and as you face up to many questions including that of fair and reasonable remuneration for psychological services, then you find the indispensability of professional and scientific associations, such as this newly organized Ontario Association.

In looking to the future, there is no question but that psychology will play a major role in the realms of health, education, industry, and social welfare. Psychology has already acquitted itself magnificently in these fields and will become a more potent force in the years that lie ahead. Progress will be facilitated through partnership with colleagues in other professional groups who have profited through co-operative endeavour in the past and who will seek increased association in the future.

The field of work in which I am engaged has constantly looked to psychologists for help and has received so much vital assistance that new avenues for human service have been opened up. This, in turn, has created a pressing need for more and more psychological participation.

The record of psychology during the recent war is noteworthy. There is furnished clear-cut evidence that psychologists can assume responsibilities for noteworthy service in a great variety of settings. Of particular significance is the fruitful partnership that was established with medicine during the war period and I would like to discuss the further development of this partnership and raise such questions as the following: (1) What does medicine require from psychology in the development of comprehensive, effective health services? (2) What is involved in gearing psychology for the most effective partnership with medicine? (3) Would it be in the best interests of psychology as a basic science to give consideration to medical needs?

[1]Address given to the Ontario Psychological Association, Toronto, February 15, 1947.

In regard to the first question, it seems to me that medicine needs psychological assistance in those situations where mental testing is required, or where health training is involved, or where the psychological sanitation of the environment is a requisite, or where a group approach is adopted. For psychologists to be helpful in medical settings, however, they should bring to their work a background of training in dealing with people and their problems, as well as a familiarity with psychological concepts and techniques and a scientific working knowledge in the broad field of human behaviour.

To date, medicine has looked to psychology for assistance when psychometrics could be of special value, but psychometrics by itself does not furnish a broad enough base for full-fledged partnership wherein psychologists might have the opportunity of satisfying and challenging professional work. If, however, there is added to psychometrics, clinical personality appraisal and *health training*, then the horizons for useful work are enormously extended, and there is provided a base that is broad enough for a significant specialty that might be labelled as "medical psychology."

You may ask what I mean by the term *health training*. I am not referring to health education for the public at large, but rather to individual training, or training in small groups that has for its aim either the promotion of positive health or the furtherance of recoveries among those who are in a depleted state of health.

We know the value of training in the field of mental deficiency. We are familiar with Chappell's work in curing cases of peptic ulcer through emotional training. We have reports from England that the length of labour in cases of primipera can be reduced by two hours through training in the elimination of fears during pregnancy. We know of the work of Professor Bott and Dr. Blatz during the First World War in promoting muscular functioning through training in gunshot cases. We have evidence of the value of training in regard to the psychoses, the neuroses, pulmonary tuberculosis, and many other conditions.

To my knowledge, the question of health training as applied to the prevention and treatment of human disabilities has never been adequately assessed and developed by any competent professional group. Occupational therapists have made a contribution, it is true, but only in a limited way; and I am of the opinion that here is a challenge that can be met more effectively by psychology than by any other discipline.

The question need not arise as to whether psychologists should take over broad therapeutic functions in regard to the neuroses and other human disabilities. The field of psychologists might very well be restricted to health training, never working independently but always in association with a medical team. In connection with many disabilities, including the psychoses

and neuroses, the fact may very well emerge that health training is the most potent of our therapeutic instruments.

Since there is need today for a sharpening of our therapeutic tools, particularly in connection with the neuroses that are as prevalent as the common cold, it is my opinion that psychologists can make a major contribution in this regard. As we all know, psychiatry is moving further and further in the direction of psychoanalysis and, while this trend is profitable in giving psychiatry greater insights into the so-called mechanisms of human behaviour, attention is being diverted from many practical and profitable avenues in the treatment of sick people. As a research approach, psychoanalysis is magnificent. In the field of therapeutics it has great limitations; but a significant forward step could be taken in therapeutics via the avenue of health training wherein full advantage is taken of the insights provided by psychiatry and psychoanalysis. And psychologists rather than psychiatrists could be expected to foster necessary progress because of their fundamental interest in all that pertains to learning and to training.

In addition to psychometrics and health training, there is a third function that might well intrigue medical psychologists, and that is the psychological sanitation of the environment. We are familiar with sanitation when applied to sewage disposal, milk inspection, and the removal of noxious influences that interfere with physical health. For the conservation of mental health we need to employ a psychological sanitary approach in schools, homes, industries, hospitals—in fact, in every setting in life. And this necessary work can best be entrusted to psychologists.

A fourth function of medical psychologists relates to group undertakings in health—to group therapy that holds so much promise in regard to many human disabilities. Since group therapy is largely a matter of health training, it would naturally fall within the compass of the work of medical psychologists in association with medical colleagues.

It goes without saying that psychologists who have developed skills in psychometrics, health training, psychological sanitation, and group therapy would be in great demand by health departments, by departments of education, by hospitals, by industry and by medicine generally.

In attempting to answer the second question propounded—What is involved in the gearing of psychologists for the most effective partnership with medicine?—it would seem that the first requisite in this regard is provision in the undergraduate years of training for opportunities to work with people; to assume, under supervision, obligations to contribute to the adjustment and welfare of a family or two, or of several specially selected individuals in need of help; and to sit in case conferences with psychiatrists, social workers and psychologists wherein all are participating.

One often hears the criticism, whether justified or not, that psychologists tend to be academic, that they are too far removed from humans in

the work-a-day world and that they are in danger of failing to develop a human touch and a human understanding that cannot be nourished adequately in an artificial laboratory setting. There may be some basis for this critical attitude, but psychological training can be so organized that such a criticism would not hold.

In regard to post-graduate training, partnership with medicine would be greatly facilitated if special courses were provided for those psychologists who have the desire to enter the health field as medical psychologists. In this course of training, the students should get a solid grounding in clinical psychiatry and reasonable orientation in some other medical subjects. The aim in this connection is not the production of non-medical psychiatrists, but rather the nourishing of insights in regard to human behaviour that can be fostered by psychiatry, together with the gaining of an appreciation of those areas where work on the psychological level must be integrated with medical work that takes into account physical pathology. In this post-graduate course, attention might be given to psychometrics as applied to medical problems, to health training, to psychological sanitation, and to group therapy.

It would also be helpful if medical psychologists were to set up a professional association to safeguard standards, to effect a satisfactory liaison with psychiatry and general medicine, to project adequate scales of remuneration for accredited personnel and so on.

The last question I raised—Would it be in the best interests of psychology as a basic science to give consideration to medical needs?—is something for you, in psychology, to answer. You must face the broad issue as to whether it is sound for psychology to encourage specialties in its own field, of which medical psychology is but one. If you make provision for this latter specialty, you are opening the door for the cultivation of others such as educational psychology, industrial psychology, child psychology, and so on.

In looking to the discipline of medicine, we find that specialization has added enormously to the sum total of medical knowledge. And what applies to medicine may possibly apply to psychology.

In conclusion, I would say that there is a better opportunity in Canada than in any other part of the world for the cultivation of the mental sciences and for country-wide demonstrations of their value in forwarding human welfare.

GENERALIZATION AND CENTRAL TENDENCY IN THE DISCRIMINATION OF A SERIES OF STIMULI[1]

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STUDIES OF LEARNING based upon the conditioned response have made effective use of the principle of generalization. This principle implies that stimuli other than the original conditioned stimulus may elicit an unconditioned response; i.e., the organism incorrectly responds to stimuli similar to that to which it has been conditioned. Generalization is due to inadequate discrimination causing erroneous responses, the frequency of which forms a gradient (the gradient of generalization) that falls off in inverse proportion to the similarity of the false stimuli to the correct stimulus. Hence, on a continuum of similarity to the original stimulus, the gradient of generalization varies inversely with the serial distance—i.e., the displacement, in the series, of the incorrect stimuli from the correct stimulus.

Other theoretical viewpoints employ the concept of generalization, although not necessarily under the same name; thus Thorndike, for instance, calls it the "spread of effect." In spite of its importance, for generalization is not restricted to studies of learning, having been utilized in studies of discrimination and memory, it has not been adequately investigated. In this respect it resembles the concept of central tendency, which, since Hollingworth's (2) studies years ago, has been largely neglected, although it also is an important biasing factor in judgment. (By central tendency is meant the tendency to yield judgments approaching the centre of the series, or more properly, some weighted average of the series.) In this paper it is proposed to investigate two points, namely: What is the form of the generalization curve, and how is it influenced by the central tendency?

Since the findings of this paper are based upon data gathered for another purpose and published elsewhere (5), the material and experimental procedure will be treated briefly. Seven O's made a prolonged series of judgments of colour mass on material which was tachistoscopically exposed for brief, controlled periods. The material consisted of six sets of cards, each of which comprised eleven cards printed in two colours to form a graded series such that, as one colour gradually increased from card to card, the other diminished. Each card held thirty-six evenly spaced and randomly distributed dots in either of two colours, blue and green. On one card, there were twenty-three blue dots, and hence thirteen green dots; on the next card in the series, twenty-two blue dots and fourteen green dots;

[1]Paper read at the Annual Meeting of the Canadian Psychological Association, Ottawa, April 10-12, 1947.

on the next card, twenty-one blue and fifteen green; the end card of the series had thirteen blue dots and twenty-three green dots. As each card was exposed, O had to determine the relative amount of a previously designated colour, and locate on a scale from one to eleven the point which, in his opinion, represented the relative amount of the designated colour. Hence, the psychometric procedure used was that of the absolute judgment. Preliminary practice was given before the experiment proper, and also before each session. A total of 1,650 judgments was obtained from each O, yielding some 11,550 judgments in all.

The spread of O's judgments, i.e., the degree to which the scale positions, as judged, approached the actual scale positions, may be seen in Table I. Generally speaking, the correct position is most frequently given,

TABLE I
DISTRIBUTION OF JUDGMENTS

RANK	1	2	3	4	5	6	7	8	9	10	11
1	254	196	201	132	106	63	49	18	10	12	9
2	161	186	208	185	141	61	49	29	8	12	10
3	76	116	207	211	177	108	74	40	17	19	5
4	50	87	170	217	181	139	80	63	23	26	14
5	55	77	163	193	185	148	122	55	31	12	9
6	8	28	55	118	180	178	163	147	86	53	31
7	7	25	49	80	97	152	186	176	126	86	66
8	5	17	48	57	87	116	163	203	166	116	72
9	12	14	30	53	69	82	148	184	191	155	112
10	2	5	16	38	67	79	117	184	173	190	179
11	2	4	9	18	44	48	67	157	173	235	293
Totals	632	755	1,156	1,302	1,337	1,174	1,218	1,256	1,004	916	800

The heading "Rank" refers, horizontally, to the responses, and vertically, to the stimuli. Thus the Table reads, under horizontal Rank 5, and vertical Rank 5, 185, which is the number of correct responses to stimulus 5; and under vertical Rank 5 and horizontal Rank 6, 148, which is the number of incorrect responses displaced one position to the right of stimulus 5.

and the frequency of the judgments falls off as deviations from the correct position increase. In this table it may also be seen that there is a separate generalization gradient for every stimulus, and in fact, with the exception of the terminal stimuli, 1 and 11, gradients exist on both sides of each stimulus. The trend is most obviously seen by averaging the gradients for all stimuli to obtain an average generalization curve. To indicate the method, the procedure for one side only of the curve is given in Table II, where the correct responses for every stimulus are collected under the column headed C; those responses given to the stimulus on the immediate right of the correct stimulus are listed in the column headed 1; those responses given to the stimuli two serial places to the right are given in column 2, etc. It is to be noted that there are eleven stimuli, to each of which correct responses have been given and are listed in column C, but that there are only ten stimuli one place to the right of the correct

TABLE II
GENERALIZATION CURVE

RANK	C	1	2	3	4	5	6	7	8	9	10
1	254	196	201	132	106	63	49	18	10	12	9
2	186	208	185	141	61	49	29	8	12	10	
3	207	211	177	108	74	40	17	19	5		
4	217	181	139	80	63	23	26	14			
5	185	148	122	55	31	12	9				
6	178	183	147	86	53	31					
7	186	176	126	86	66						
8	203	166	116	72							
9	191	155	112								
10	190	179									
11	293										
Average	208.2	178.3	147.2	95.0	64.0	36.3	26.0	14.8	9.0	11.0	9.0
Other side of Curve		173.0	129.1	88.1	57.7	41.5	27.2	13.3	8.7	3.0	2.0

This table groups and averages the frequency of responses assigned positions equally remote from the correct position, and is formed from the right half of Table I.

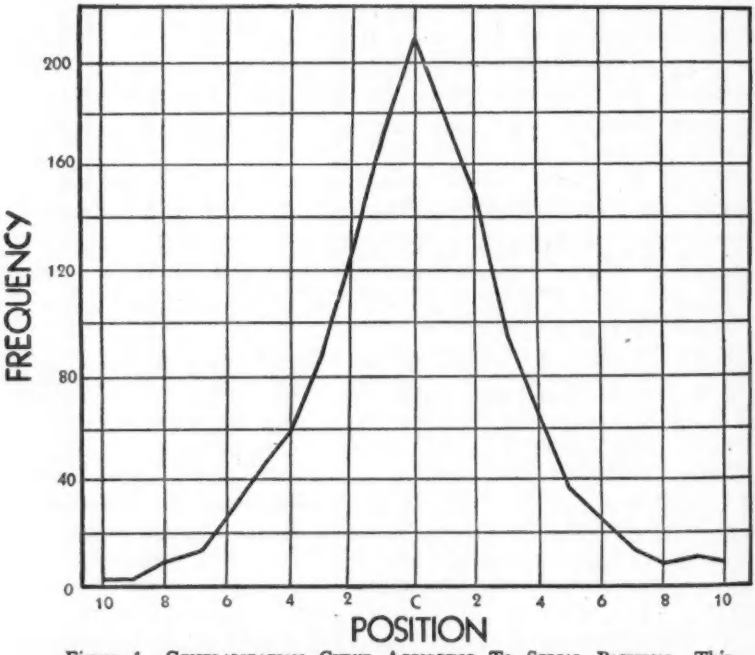

Figure 1. GENERALIZATION CURVE ACCORDING TO SERIAL POSITION. This figure gives the frequency of the correctly discriminated responses, C, and of the erroneous (generalized) responses which deviate 1, 2, etc., positions from the correct value. The ordinates are averaged for the number of times each situation occurs.

response (column 1), and only nine stimuli, two places to the right, (column 2), etc. Thus the serial distances on the stimulus scale occur with varying frequency in Table II, and hence the judgments of each serial distance from the correct position should be averaged for both sides of the curve. The result is shown in Figure 1, which is a slightly skewed, leptokurtic frequency curve, extending to the limits of the series.

This is the average curve of generalization, but it masks certain tendencies, so the individual curves for each of the eleven positions were studied, although they are not shown here. In general, the individual curves follow the same pattern. They tend to group together, although the slopes are fairly constant and inversions are rare. The skewness changes sign according to the side of the curve, being positive in the smaller scale positions, and negative in the larger positions (Table III).

TABLE III
CENTRAL TENDENCY AND VARIABILITY

RANK	1	2	3	4	5	6	7	8	9	10	11
Median	2.87	3.36	4.10	4.50	4.70	6.25	7.12	7.66	8.13	8.60	9.51
Mean	3.32	3.66	4.33	4.73	4.83	6.33	7.00	7.38	7.78	8.32	9.03
σdist	2.18	2.12	2.09	2.14	2.03	2.10	2.27	2.34	2.30	2.03	1.97
Skewness	.62	.42	.33	.32	.19	.11	−.16	−.36	−.46	− .74	− .76
Displacement	1.87	1.36	1.10	.50	−.30	.25	.12	−.34	−.87	−1.40	−1.49
Gap	—	.49	.74	.40	.20	1.55	.87	.54	.47	.47	.91

Distortions from symmetry of the individual curves are best explained as being due to the presence of a serial effect known as central tendency,

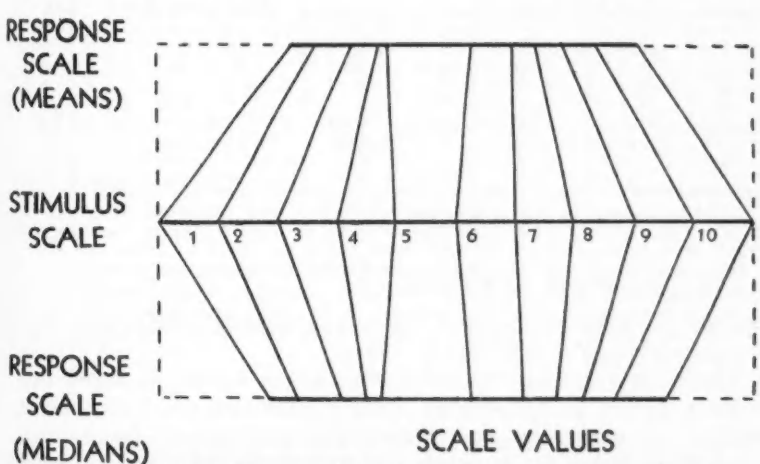

Figure 2. CENTRAL TENDENCY. The compression of the response scales, for means and for medians, indicates the presence of two foci, instead of one, in each scale. These foci are located approximately in the region of scale values 4-5 and 7-8.

that is, a tendency to yield judgments approaching some weighted average of the series. In longer series, such as this one, the series tends to be broken up subjectively, and the estimated scale values, as determined from the medians, tend to converge, not upon the centre of the series, but upon two or more focal points.

The central tendency is most clearly seen in Table III, which gives the scale medians and means for the group. It is to be noted in Figure 2, which is based upon this table, that the medians tend to converge at two points between positions 4 and 5, and positions 7 and 8, which seem to act as foci. The gaps between the medians vary, although objectively, i.e., on the stimulus scale, they should remain the same; and they are at a minimum between positions 4 and 5, and positions 8 and 10. The large gap between positions 5 and 6 shows the subjective breaking up of the series, despite its objective uniformity. A study of the positional medians as yielded by each individual shows this effect in a more pronounced way, and frequently some subjective equalities are found among the stimuli. (Compare positions 4 and 5, and positions 8 and 9 in Table IV.) From Table III it may also be noted that there is a restriction in the range of the response scale, as judged from the medians; for this group, it is 9.51 - 2.87 or 6.64, whereas the stimulus scale has a range of 11.0 - 1.0 or 10.0. When this range is calculated for each individual (Table IV), it is

TABLE IV

INDIVIDUAL RESPONSE SCALES

Observer	% Correct	Position I	Position II	Range	Equal Positions		Foci	
1	26.8	2.10	9.69	7.59	4-5	—	4	7,9
2	23.3	2.03	10.06	8.03	—	—	4	8
3	19.4	2.27	11.01	8.74	3-4-5	—	4	8
4	19.2	2.70	9.61	6.91	4-5	8-9	4	8
5	19.0	2.88	8.92	6.04	4-5	7-8 9-10	4	7,9
6	17.3	4.29	8.41	4.12	4-5	8-9	4	8
7	13.9	3.93	8.93	5.00	3-4-5	8-9	4	8

The percentage of correct responses is given in Col. 2; the range, which indicates the Central Tendency, in Col. 5. Under the heading "Equal Positions" are listed the positions for which the scale values are equal, on either half of the scale. The apparent foci, as determined from the convergence of the scale values, are listed in the last two columns.

seen that those who discriminate best tend to have the widest range, i.e., they show the least central tendency effect.

From Figure 3, which is based on the totals of Table I, a marked discrepancy is noted in the frequency of the judgments at the various serial positions, and in the accuracy of these judgments, in spite of the fact that the objective stimuli do not greatly vary in difficulty. The frequency with which the various responses are assigned throughout the scale is shown in Curve A, where maxima occur at positions 5 and 8. When the graph of

the correct judgments is studied, Curve B, there seem to be three parts to the curve, with positions 4 and 8 being the division points. This division of the curve may, however, be an artifact, due to the preponderance of judgments allotted to the central positions. Accordingly, when the relative accuracy is determined by calculating the percentage that the ordinates of Curve B are of those of Curve A, the resultant curve, Curve C, becomes

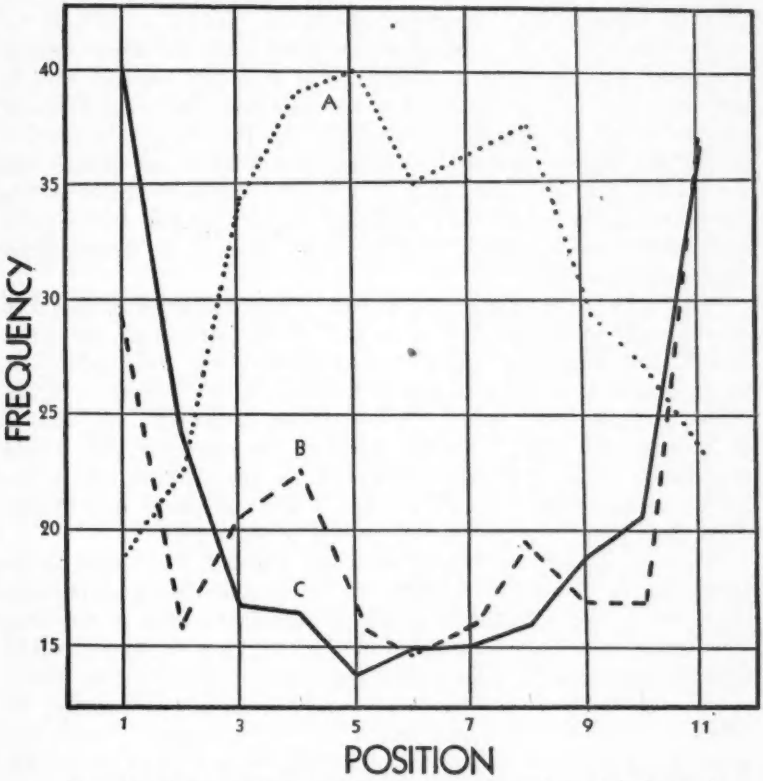

Figure 3. RESPONSES ACCORDING TO SERIAL POSITION. Curve A is the number of responses assigned to various positions. Curve B is the absolute number of correct responses per position. Curve C is the relative number of correct responses. Note the modes at positions 5 and 8 in Curve A, and the minor modes at positions 4 and 8 in Curve B.

obviously a single catenary curve, such as has been found previously in studies of serial position for memory and for discrimination (4).

To summarize, the data of this paper demonstrate that the generalization curve in a perceptual task where the absolute method is used is of a frequency type, and extends on both sides to the limits of the series. In this case the curve was also leptokurtic and slightly skewed. There is a

pronounced central tendency, or more properly speaking, a series effect, which seems to compress O's responses towards two foci in the series, and is reflected by the distortion of the positional mean or median values.

Discussion

The kurtosis and skewness of the generalization curve call for an explanation. If the judgments were so difficult that discrimination is impossible, the curve would be merely a straight line, parallel to the axis, for all positions would have an equal chance of being selected when any card is exposed. This is, of course, assuming that no central tendency effect is present. As learning proceeds, or as O's become more practised and the task becomes easier, discrimination takes place, and the non-discriminated or generalized responses diminish in frequency according as they deviate from the correct position. The result is a typical frequency curve, which approaches normality only at a particular stage of practice, and becomes more and more leptokurtic with increased practice as discrimination becomes more accurate.

Thurstone (6) has pointed out that the generalization curves should be skewed owing to the curtailing of the ends of the distributions, but in this case the central tendency is also a strong biasing factor. The tendency for the judgments to be given in greater frequency in the vicinity of certain points, here called foci, results in a compressing of the subjective scale in the vicinity of the foci. That the points on the subjective scale should most closely approach the equivalent points on the objective scale at the foci seems at variance with the concept of terminal frames of reference, which make for greater precision at the ends of the series.[2]

Two explanations might help solve this difficulty. First, there is the assumption that, owing to its length, the series is broken up subjectively, and there emerge, in addition to the two terminal frames of reference, other frames of reference situated at the foci. Curve B of Figure 3 would seem to bear out this hypothesis, for it shows three catenary curves, instead of one, for serial position. This inference may be correct, but probably the influence of the frames of reference at the foci is relatively weak. The second explanation takes into account accuracy in relation to the number of judgments given for any point. Curve C of Figure 3, which is the percentage of accurate judgments in terms of the total judgments assigned to any position, seems to be a fairly smooth catenary curve, with marked terminal frames of reference, and only the slightest indication of the influence of the foci.

Accordingly, the first explanation for the fact that the subjective scale most closely approaches the objective scale near the foci, stresses the

[2]By frames of reference are meant anchor points, "points de repair," which tend to fixate and stabilize the judgments. Helson (1), in analysing a different psychological process, distinguishes between frame of reference and anchor points.

formation of additional frames of reference at these points. The second explanation stresses the fact that, when the influence of the central tendency in massing the selections of certain points is allowed for, the relative accuracy at all points conforms with the single catenary curve, thus indicating the predominating influence of the terminal frames of reference.

If stimuli which form a series are presented under controlled conditions to O, several phenomena may be observed, no matter whether the process is one of discrimination, of learning or of memory—which fact suggests a relationship between these processes. Whenever O fails in his task of discriminating or recalling the stimuli an error results, i.e., he generalizes the response. This process may be traced through the various stages of learning, for, if the discrimination is quite difficult, errors will be frequent at the beginning and will gradually become less numerous. The allocation of these erroneous responses to any one stimulus at various points of the scale follows the laws of probability, so that the resultant generalization curve may be of various frequency types. With additional practice, the erroneous responses of the O's tend, in their scale values, to approach the correct responses; in other terms, the generalization curve becomes more and more leptokurtic.[3]

When judgments must be made in the neighbourhood of the discriminatory threshold, O is prone to lose confidence in his judgment and to rely more on subsidiary cues. He establishes standards by which to gauge the stimuli and to form a subjective scale. Unless this scale is anchored for him by some fixed standard, either experimentally presented or absolutely formed by his prior experience, he makes use of relative standards, called frames of reference. As a rule, in a series of closely similar stimuli these frames of reference are terminal, in the vicinity of which the judgments are most accurately and confidently given. The influence of the terminal frames of reference falls off exponentially, so that, when the frequency of the accurate responses is plotted, a catenary curve results, which is not necessarily symmetric, as one frame of reference, generally the initial one, may be more potent than the other (4).

In a long series the influence of the terminal frames of reference is not sufficient to carry to the centre of the series, and O becomes confused and makes use of cues that are not primarily perceptive and starts to rely on some pseudo-probability theorizing of his own making. Instead of attempting to locate precisely the individual stimuli, O becomes satisfied to locate them approximately according as they are closer to the ends of the series, and knowing that they should not be massed there, he allocates them, more as groups than as individual stimuli, to focal points, new frames of refer-

[3]It is of interest to compare this statement with Hull's (3) discussion of data from the learning of rats in a four-choice runway.

ence, which are not nearly so sharp and clear as the terminal ones; that is, his responses are assigned with greater frequency in the region of the foci. In other terms, his judgments are biased by what is known as the series effect or the central tendency. This tendency does not materially improve the relative accuracy of the responses, it merely increases their frequency at certain regions of the scale in the vicinity of the foci. Although the relative accuracy, i.e., the ratio of the accurate to the inaccurate responses, still follows the catenary pattern, the absolute accuracy increases at the foci, owing to the added frequency with which these responses are given. The result now is that the figure formed by the accurate responses (Curve B), seems to comprise three catenary curves, with maxima at the terminal frames of reference and minor maxima at the foci. The subjective counterpart of this scale would be the apparent formation of three series rather than the one continuous objective series.

Accordingly, the relative and the absolute frequencies of the accurate responses at varying points of the scale and the manner in which the errors are generalized may be accounted for on the basis of the principles of generalization of error, central tendency, and formation of terminal frames of reference.

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STUDIES IN INTERNATIONAL MORSE CODE

IV. "CODENT"—SIGNAL TRAINING SELECTION TEST

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THE SELECTION of Morse Code operators for army training presents a difficult problem. Inadequate methods of selection result in a high percentage of failure in code classes, especially in high speed operating. These failures are expensive in terms of man hours spent in attempting to learn code that might be spent in another trade and in terms of wasted effort on the part of instructors whose time might be better employed. The selection of operators consequently assumes great importance and considerable endeavour has been expended in search for practical methods of screening potential operators from the rank and file.

Cook[1] studied the records of 639 men to determine the relationship of M-test scores, previous experience, age and occupation to Morse Code achievement. He found previous experience to be by far the most significant of these pre-selection factors. All sub-tests of the M-test, except 4 and 5, contributed something to prediction, test 8 having the highest correlation with class records. School grade also had some predictive value. Cook reported that men at age thirty and over appeared to have more than average difficulty in learning code, and that clerical workers had a slight advantage over nonclerical workers.

Springbett[2] gave a battery of personality tests to sixty-seven high speed operators. There was statistical indication that their code achievement was related to the following tests in descending order of efficiency: Health Scale of the Bell Adjustment Inventory, Self-Confidence Scale of the Bernreuter Personality Inventory and the Neymann-Kohlstedt Test for Introversion-Extroversion. Prediction was improved by combining these tests. A further test made up of significant items as determined by factor analysis was given to 112 low speed operators. The results of this latter test failed to support the previous findings. Apparently the lower operating speed did not produce the same personality stresses as those found when higher speeds were demanded. Springbett confirmed Cook's findings in regard to educational status and experience.

Three code aptitude tests, the U.S. Signal Corps test, the Kurtz Speed-of-Response test and the Thurstone test, which had been developed in the United States, were tried out in Canada. None of these tests proved to be extremely satisfactory. It was found that any critical score chosen

[1]T. W. Cook, "Analysis of Factors Predicting Success or Failure in OWL and RSW Classes at A-7 C.S.T.C." Unpublished.

[2]Bruce Springbett, "Relation of Personality Tests and Other Measures to Achievement in the Operators, Wireless and Line, Signals Course at A-7 C.S.T.C." Unpublished.

either failed to eliminate an appreciable percentage of poor men or was too costly in elimination of potential operators. Of these three the Thurstone Code Aptitude Test gave the best results.

The data obtained from a questionnaire used for screening by Easterbrook[3] were also studied. Positive selection factors appeared to be Morse Code experience, a dictation test, education, M-score and volunteer status. The optimum age for learning code was shown to be twenty-three years with a slight decrease in ability above and below that age. Dancing, ability to play a musical instrument and interest in music were apparently unrelated to success in receiving Morse Code.

After an extensive study of possible selection methods, five tests were assembled by the authors to form a battery which, when code experience was taken into consideration, would, it was thought, cover the processes involved in learning Morse Code. The name "Codent" was formed of the initial letters of the sub-tests.

A maze test, adapted from the Johns Hopkins Hand-Eye Co-ordination Test, was included in order to determine the relationship between manual maze performance and code sending ability. A continuous line made up of 100 one-inch segments is to be traced along a 5/32-inch pathway. The line runs in eight directions corresponding to the main points of the compass. One and one-half minutes are allowed to complete the maze and a mark is scored for each inch completed without touching a side. Although not used for selection, this sub-test has been retained for future study.

The analysis of the Easterbrook questionnaire showed a positive relationship between training success and the ability to recall a verbal order after an interval of several minutes. In the Codent Test, a typical operational order containing twenty-five significant items is given twice. After a retention interval of twelve minutes the candidate is instructed to write the order. Retroactive inhibition is introduced by administering dictation between the giving of the order and its recall.

Thurstone made use of a dictation test in some of his preliminary work on code aptitude measurement and the Easterbrook questionnaire showed that ability to copy dictation had some predictive value. In the Codent dictation sub-test 100 words of connected prose are dictated. All misspellings and omissions are scored as errors but punctuation is not considered. The test gives some indication of the candidate's educational level, neatness, auditory acuity, and ability to translate sound symbols into graphic form.

In order to determine the subject's immediate memory and auditory span of attention, groups of numbers are read at a uniformly high speed. As soon as a group is read it is written down by the candidate. Eight

[3]Major W. J. A. Easterbrook, "Selection of Signallers and Driver Operators (All Arms)." Unpublished.

groups, three of each length from three to ten digits, are used. To be scored correct any group must be copied without error of any kind.

The sub-test designed to measure the candidate's code learning ability is adapted from Thurstone's Code Aptitude Test. Code signals for the characters D, K, and R are taught and the candidate must differentiate them from other code signals. One hundred discriminations must be made on this sub-test.

Code experience is indicated by the candidate when he fills out the short questionnaire at the beginning of the test. The score obtained on the Thurstone sub-test serves as a check on the experience claimed.

After preliminary trials, the complete test was recorded on two sixteen-inch phonograph discs in order to standardize presentation. The actual playing time of the records is forty-eight minutes. Administrative details, however, increase the time requirement to approximately one hour. It is recommended that the test be played over headphones. This ensures that all candidates hear equally well. It has also been noted that the use of headphones induces better concentration, probably due to the fact that headphones produce the effect of isolation.

In using the Codent Test, no composite score is computed but a profile is made up from the results of the sub-tests. All sub-tests are marked on the basis of 100, 55 being chosen as the critical score. Any individual who is without experience and scores less than 55 on the Thurstone and any one other of the Dictation, Order, or Numbers tests has been found unsuitable for training. If the Thurstone score is over 55 but Dictation, Order, and Numbers test scores are all below 55, rejection is also indicated. Candidates with experience were definitely found to be most suitable for training. If the Thurstone score is less than 80, however, it is doubtful if the claimed experience is of much value.

After critical scores were set on the basis of the results of preliminary trials, an analysis was made of the Codent profiles of 313 trainees. The test was administered to these men upon arrival in the training centre where they were enrolled in eight- or ten-week courses in code training. Those who successfully completed their course were qualified to receive code at a speed of ten words per minute.

Of the 313 men studied, eighty would have been selected because of previous code experience. Seventy-six of these completed the course within the required time and four qualified after being retarded one or more weeks. Of the remaining 233 men, thirty-seven would have been rejected for failing the Thurstone and one or more of the Dictation, Order, and Numbers tests. Included in these thirty-seven rejections were seven men who qualified without retardation, sixteen after retardation and fourteen who were untrainable. This would have left 196 men of whom eighteen would have been rejected for failure on all three of the Dictation, Order,

and Numbers tests. Six of these qualified without retardation, four after retardation and eight failed to qualify.

Thus the Codent test selected 224 men who qualified without retardation, thirty-two who qualified after retardation and two who were untrainable. The test rejected thirteen who qualified without retardation, twenty who qualified after retardation and twenty-two untrainables. It predicted twenty-two of twenty-four, that is 91.7 per cent of the untrainables at a cost of thirteen out of 237 or 5.5 per cent of those who qualified without retardation. At the same time twenty out of fifty-two or 38.5 per cent of the slow students would have been eliminated.

The reliability of the Codent sub-tests was determined both by the split-half method and by means of a retest. Corrected by the Spearman-Brown Prophecy Formula, the split-half correlations for the sub-tests used in selection ($N = 200$) were: Order, $r_{nn} = .80$; Dictation, $r_{nn} = .94$; Numbers, $r_{nn} = .89$; Thurstone, $r_{nn} = .92$. Retest correlations were obtained by administering the test twice to seventy-eight men. An interval of from two to six weeks intervened between testings but no code was taught in the interval. Under these conditions the product-moment correlations were: Order, $r = .78 \pm .03$; Dictation, $r = .86 \pm .02$; Numbers, $r = .80 \pm .03$; Thurstone, $r = .83 \pm .02$. These high correlation coefficients indicated a quite satisfactory reliability in the case of the four sub-tests which are used as a basis for selection.

To determine validity, Codent sub-test results were correlated with scores obtained on the Vimy Code Letter Test of Morse Code Achievement. Correlation coefficients were computed on the basis of 200 men regardless of experience. Retarded men were omitted because of having had extra code practice before taking the achievement test and the untrainables were omitted because they had not been given the Letter Test. As might be expected where these two lower grades were omitted, the correlation coefficients were not high. They were as follows: Order, $r = .04$; Dictation, $r = .22$; Numbers, $r = .22$; Thurstone, $r = .38$. While the Order sub-test correlated poorly with the Letter Test, it correlated better with the Dictation Test ($r = .31$, the highest intercorrelation obtained). As Clark Hull[4] says, "The mere fact of a test having a correlation with the criterion which would make it of negligible value if standing by itself, does not necessarily make it so when considered as a unit of a battery." It was decided, therefore, on statistical as well as on practical grounds, to retain the Order test in the Codent battery of tests.

As has already been indicated, the Codent test showed high relationship with success in learning to receive Morse Code. A value for chi-square of 131.5 was obtained which indicated that the chances were much greater than 99 out of 100 that the distribution obtained was not due to chance.

[4]Clark L. Hull, *Aptitude Testing*. Yonkers: World Book Company. 1928.

A correlation coefficient of $r = .41$, was obtained when grade and errors made on the Dictation test were correlated ($N = 326$). When total M-score (less 4 and 5) was correlated with Codent sub-tests used in selection the following correlation coefficients were obtained: Order, $r = .37$ ($N = 244$); Dictation, $r = .41$ ($N = 246$); Numbers, $r = .20$ ($N = 249$); Thurstone, $r = .34$ ($N = 170$).

The method of setting critical scores is somewhat arbitrary but more systematic methods would have been difficult to apply to the relatively small number of test scores available. The difficulty is further increased by the fact that all the men to whom the test was applied were pre-selected by the army examiner. Justification for this method must be found in its success.

Further attempts to secure validation of the test were precluded by its enthusiastic reception and use as an aid in selection.

THE SYRACUSE CASE STUDY TESTS

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THE PROBLEM OF PROVIDING adequate case study material for classes in psychology is a recurring one. In these days of over-size classes the problem is particularly severe; but there is every reason to believe that it will still be with us after the peak of the teaching load has passed.

A partial answer is to be found in the Case Study Tests which form a part of the Syracuse Tests in Adolescent Development (1). These tests provide a printed case history, together with questions concerning diagnosis and the choice of remedial methods. Such cases do not have all the advantages found with flesh-and-blood cases, but they are a very good substitute and they do permit the student to try his own ideas on diagnosis and treatment, even at an early stage in his psychological training.

To date, three cases have been published. The *Case of Barry Black* describes a fifteen-year-old boy of average intelligence, average social and economic status, and average progress in school. His troubles are emotional, and based upon insecurity in social situations; the case opens when he gets into a fight at a Y.M.C.A. dance. The *Case of Connie Casey* presents an eighteen-year-old girl of superior intelligence and very poor socio-economic background. She is in the final year of High School and has been doing very well in school, but now becomes truant and apathetic. The *Case of Sam Smith* portrays a twelve-year-old boy in elementary school. He is the son of a successful and highly-respected professional man, but is below average in intelligence. He has been receiving poor grades, and also indulges in unruly and boisterous behaviour.

The method of presentation is uniform for all cases. There is a case history of approximately three thousand words, divided into three sections. After each section there are twenty to thirty questions on diagnosis, and ten to twenty on remedial procedures. The answer sheets provide for five possible answers to each question: for diagnosis, the statement can be shown as True, Possibly True, No Evidence, Possibly False, or False; under remedial procedures, each suggestion can be graded Very Advisable, Advisable, Undecided, Inadvisable, or Very Inadvisable. Several of the questions given after the first section are repeated after other sections, in which further information may be available on the points covered. Each case can be answered in ninety minutes or less. An answer sheet can be hand-scored in ten to fifteen minutes; this time can be cut down if a calculating machine is used. Each of the five possible answers to every question is assigned a numerical value between -4 and $+4$, and the score is the algebraic sum of the values for the answers chosen.

Norms have been established with students in advanced courses in psychology in four American colleges. Interpretation of individual scores is

provided for by percentile tables, which are available separately for the score on diagnosis and for the score on remedial measures, as well as for the total score. Reliability coefficients for these tests, obtained by the split-half method, have been published; they are: Black, .79±.038; Casey, .77±.041; Smith, .73±.046. Measures of validity are not given; the author states that "the validity of the three case studies rested upon construction and coverage, expert scoring, item consistency, reliability, and utility." (2)

Some experience has been gained with these tests at the University of Alberta. During the regular 1946-47 session, the *Case of Sam Smith* was given to an introductory course for freshmen (173 students) and to an advanced course for juniors and seniors (72 students). The *Case of Barry Black* was given only to the advanced course. During the 1947 Summer Session, the *Case of Sam Smith* and the *Case of Connie Casey* were given in the counterpart of the same advanced course (22 students).

The results obtained at Alberta are generally comparable with those obtained with the standardization groups in American colleges. With one minor exception (the Summer School results with the *Case of Sam Smith*), differences between comparable means are slight. No statistical measures of significance have been calculated, because of the fact that published norms show only the semi-interquartile range. Inspection of the results, however, indicates that the differences are not statistically significant. This general similarity is confirmed by the fact that the correlation between *Black* and *Smith* from our data was .52 ± .09, while the norms show the same correlation as .55±.09.

During the scoring of answer sheets, a number seemed to show inconsistencies between scores on parts of the test. In order to gain some impression of the frequency and magnitude of such variation, a number of intercorrelations of parts of the tests were calculated. These are shown in the accompanying table.

Correlations	Black	Smith Introductory Course	Smith Advanced Course
Diagnosis Score and Remedial Score.....	.11 ±.12	.24±.07	.17±.11
Diagnosis Pt. III and Remedial Pt. III.....	.42± .09	.26±.07	.32±.11
Diagnosis Pt. I and Diagnosis Pt. III.....	.30±.11	.15±.07	.19±.11
Remedial Pt. I and Remedial Pt. III.....	.31±.11	.29±.07	.07±.12

The low correlations between diagnosis and remedial scores are somewhat startling. Many students who made a poor score on diagnosis made nevertheless a relatively good score when choosing remedial procedures; if this situation occurred in real case studies, one would wonder what could

possibly be the basis for the treatment programme. The relationship between the diagnosis score on the final section, when all the facts have been given, and the remedial score on this section is somewhat closer in each case; even so, the correlations are lower than would be expected for a test of this sort. The other correlations show a variable but consistently small relation between the early and late sections. These facts, taken together, seem to suggest that the questions in the earlier section are of relatively less value from the standpoint of testing than are the later ones.

The author has taken the validity of the tests entirely for granted. Indeed, in a study comparing the results of these tests with results from the other part of the test battery (an objective examination based on the content of texts of child psychology), lack of agreement is interpreted as evidence that knowledge of fact and principle does not necessarily lead to intelligent or effective application of these facts and principles(2). There is an alternative hypothesis; namely, that the tests themselves, considered for the moment solely as instruments for estimating the skill of students in diagnosing and prescribing treatment, are of low validity. The results obtained* at the University of Alberta seem to support this hypothesis.

Notwithstanding these questions concerning the validity of the scores, the text of these case studies is considered to be a very valuable aid to instruction. They give an excellent description of three children in trouble. The division of the case history into sections is done in a careful and realistic manner. For example, in the *Case of Barry Black* the first section describes an incident at the Y.M.C.A. and the information which the secretary in charge can uncover at the Y.M.C.A., while the second and third sections deal with information obtained in visits to the home and school respectively. Results of psychometric tests and of interviews with teachers parents, and the children themselves, are thoroughly mixed, yet are presented in a systematic fashion. Some of the material presented is intentionally useless or misleading, and some of the opinions quoted are downright stupid. Thus the whole gives a realistic picture of the way case studies are carried out and the difficulties involved in interpreting the mass of information and misinformation received. As a result, the tests provoked a keen interest in students here, and a lively discussion of the cases was easy to obtain.

Experience with these tests at the University of Alberta, therefore, seems to show that they are valuable instruction aids, but less valuable as instruments for testing the clinical skills of students. The apparent difficulties with the validity of the scores can presumably be overcome in sub-

*This statement does not apply strictly to the *Case of Connie Casey*, since the group to which this test was given was too small for any statistical analysis of the results. Inspection of the test and of the few scores available suggest, however, that the general statements apply as well to this case.

sequent editions, or in further tests of the same sort. It is to be hoped that this type of test will soon be developed to the point where it will be equally valuable for instruction and for testing.

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The Application of the Rorschach Test to Young Children. By Mary Ford. (University of Minnesota, Institute of Child Welfare Monographs, No. 23) Minneapolis: The University of Minnesota Press. 1946. Pp. 114.

As a contribution to the scientific investigation of the Rorschach test applied to young children, this volume merits consideration. Throughout, the author stresses the need for normative data based on age groups of young subjects, emphasizing the fallibility of using criteria accepted for adult subjects in interpreting children's records. The author knowingly has to use methods of scoring and interpretation based on adult criteria because she has no other standards to use in working with her data.

Since no attempt has been made to check the reliability and validity of the Rorschach test at the preschool level, the present study had four aims:

1. To refine administrative procedures and to simplify instructions so that they are meaningful to young children.
2. To study variations in test determinants along with variations in chronological age, mental age, sex; and to present these findings as a tentative basis for future standardization of the tests in its application to young children.
3. To study the reliability of the various test determinants at the preschool level.
4. To check the validity of certain specific claims made by Rorschach as to the meaning of the various test determinants.

Ford's sample of preschool subjects consisted of 123 subjects of both sexes ranging in age from three to eight. The sample was a superior group in intelligence (av. I.Q. 124) and socio-economic status. Dr. Ford admits that, in view of the superiority of her group, the results are hardly normative.

The procedure for administering the test followed Rorschach's own method closely. The simple question "What could this be?" was asked. The major difficulty encountered was with the inquiry, since the children were often averse to going through the cards a second time. Two major innovations of procedure were adopted: (1) The cards were presented in an upright position and the child was not permitted to rotate them. This modification was necessary since it was found that preschool children occupied themselves unduly with manipulation of the cards. (2) Following Hertz, a trial inkblot was used to orient the children to the Rorschach procedure and create a favourable mental set. The experimenter was well known to all the children and took pains to prepare the children emotionally for the test procedure to make for maximum rapport.

For data on reliability, fifty-five of the subjects were given retests one month after initial testing. Stanford-Binet records were available for all children.

In scoring her records, the author followed Rorschach's original instructions supplemented by the work of Beck, Hertz, and Rickers. She states: "Since all previous workers with children had used adult norms and since no norms were available for young children, the writer saw no alternative to this very questionable procedure of using adult norms."

Some of the major results of this study are the following:

1. The analysis of responses of children of this sample indicate that the following determinants increase markedly with increasing chronological age: R, Obj, D, F, F +, % M +, % O +, and OL (organizational links, a new scoring category introduced in this study). Dr, % D, % Dr, M, % M, M+, P, O, O +, %P, and %O showed less marked increase with increasing C.A. The percentage of children using M and FM increased with increasing C.A., and at each age level the percentage of children using FM was greater than the percentage using M.

2. In general, the number of children using C, CF, and FC responses increased with increasing C.A. "The percentage of children giving CF responses was higher than the percentage of children giving C and FC responses at each age level, except at 5 years, where the percentage giving FC responses was higher." This is in general agreement with the accepted hypothesis of color dynamics during childhood.

3. "In terms of mean number and mean percentage of occurrence, no sex differences were apparent in this study. The similarity between means for boys and girls was marked, and in all cases the variation within a sex group was greater than the slight variation between groups."

4. Reliability coefficients of determinants, whether computed by test-retest or split-half method, varied between zero and .91. The reliability coefficients computed in this study in general compare favourably with those reported by other investigators and of themselves are fairly satisfactory, "especially when one considers that the interpretation of test results does not depend upon any one determinant but upon the balance and interrelationship between determinants."

5. The data of the study do not support Rorschach's claim of a relationship between W and intellectual level in terms of MA, but do support the relationship of M, %F +, C-sum and %O + to intellectual level.

6. Other conclusions related to the comparison of Rorschach *Erlebnistyp* (M:C-sum ratio and R (VIII-X): R ratio) and results of the Marston Introversion-Extroversion Scale and the Olson Behavior Rating Scale. Fair agreement was shown.

7. Only a small percentage of the children in this study approximated the usual adult *Erfassungstyp*. The typical response of preschool children was an emphasis on W responses.

No one will doubt the usefulness of Dr. Ford's study in exploring the use of the Rorschach with young children. The reviewer feels that certain considerations must be kept in mind in accepting her data. These relate primarily to sampling and statistical treatment of results. In making comparisons with respect to sex and age, the number of cases is often too small to give valid age and sex trends. In fact, trends are made much of and the impression is given that these trends point to valid conclusions even though the critical ratios reported are below the limit of statistical reliability or omitted entirely. In this respect, great confusion exists in the discussion of colour determinants (pages 47, 48, and 54).

Sometimes the data are analyzed on the basis of the average number of a particular determinant in relation to an age group, at other times, on the basis of the percentage of the determinant in the total R. The results drawn by these two methods are sometimes diametrically opposed (pages 45 and 73.). It would have made for clarity to have kept the comparisons in terms of proportions since R shows variation with age.

The author presents a list of suggestions for further study which indicates that she realizes the limitations of her data. A useful glossary of Rorscharch terminology is appended.

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The Relation of Parental Authority to Children's Behavior and Attitudes. By MARIAN J. RADKE. (University of Minnesota, Institute of Child Welfare Monographs, No. 22.) Minneapolis: The University of Minnesota Press. 1946. Pp. 123.

THAT THE CHARACTER of the home exerts an influence on the development of the child is the unanimous opinion of all writers on child behaviour. During the last decade considerable research has been reported on this relationship. This research indicates that some variations in personality are related to features of the home environment of the child. But clear-cut results are lacking, partly because of the difficulty of assessing the home atmosphere and parental techniques and attitudes.

The research under review "attempts to define in a more exact manner certain variables related to the home and to the child, and to seek out positive as well as negative influences of the home in a non-problem-child population." The attempt was moderately successful. The group studied were the forty-three children at the Institute nursery school and their parents. The children were considerably above average in intelligence and their parents were mainly from professional and managerial levels. Data were collected from the parents by the questionnaire-interview method, both parents answering the questionnaire in the presence of the experimenter. A rating of the home was attempted, and information

collected at the time the child was registered in the school was used. Data were collected from the children in two interviews. The first interview consisted of an oral questionnaire and two projective situations using pictures and doll play. The second interview included a repetition of the doll play and picture identification and three experimental situations designed to measure the child's compliance with adult directions. A further source of data was the ratings made by the teachers on the personal-social behaviour of the children in the school.

A careful analysis of these data revealed some important relationships between the home discipline and the attitudes and behaviour of the child. There is much still to be learned about the complex dynamic relationships of the home and their effect on the young child, but this research points the way for further research. It indicates the importance of comparing data from several sources in order to determine reliability. It also shows that the interview method has promise even with such young children as the preschool group studied, and although the projective techniques employed in this study did not yield very much definite information, they did show promise as a method of locating critical areas in the child's home relations. The extent of the non-experimental literature on parent-child relations indicates the importance of this problem. That a great deal of careful research is necessary to obtain dependable information about this relationship is recognized and the present study is a very good example of the value of such experimentation.

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BOOKS RECEIVED

ALLPORT, GORDON W. and POSTMAN, LEO, *The Psychology of Rumor.* New York: Henry Holt and Company. 1947. Pp. xvi, 247.

AXLINE, VIRGINIA MAE, *Play Therapy. The Inner Dynamics of Childhood.* Boston: Houghton Mifflin Company. 1947. Pp. 379.

JOSIAH MACY JR. Foundation, *Problems of Early Infancy.* Transactions of the First Conference, March 3-4, 1947. New York: The Foundation. Pp. 70.

———— *Training in Clinical Psychology.* Transactions of the First Conference, March 27-28, 1947. New York: The Foundation. Pp. 88.

STEVENSON, GEORGE HERBERT, and NEAL, LEOLA E., *Personality and Its Deviations. An Introduction to Abnormal and Medical Psychology.* Toronto: The Ryerson Press; Springfield, Mass.: Charles C. Thomas. 1947. Pp. xiii, 362.

CANADIAN PSYCHOLOGISTS will view with mixed feelings the departure of DR. GEORGE HUMPHREY for a post at Oxford University. He is the first incumbent of the chair in psychology recently established in his Alma Mater, and his appointment will be a matter of satisfaction and pride to us all. At the same time we regret that he will probably now play a less active role in psychology in Canada; his genial presence will be missed in our deliberations. Technically, Dr. Humphrey is on a year's sabbatical leave from Queen's, and he is still listed as Professor of Philosophy and head of the department there. At Oxford he is Professor of Psychology and Director of the Institute of Experimental Psychology. The latter title will apply strictly, however, only after the present director retires. Dr. Humphrey was the first Secretary of the Canadian Psychological Association, and later served as President. He, perhaps more than any one else, saw that psychology had an important contribution to make in the war, and during most of the war years he assumed leadership in making this contribution effective. He served as Chairman of the Test Construction Committee; and as liaison man with the National Research Council, he was instrumental in securing financial backing for the test construction programme. He is known to his Canadian friends mainly through his connection with Queen's and his work in psychology. When we turn to *Who's Who* we discover that he was Bible Clerk at All Soul's College; Cassel Scholar at Leipzig; Townsend Scholar at Harvard; Tutor in Latin and Greek, Burough Road College; Professor of Classics, University of St. Francis Xavier, Antigonish. Dr. Humphrey has written extensively. His new book, "Directed Thinking," is expected to be published by Dodd, Mead in February, 1948. During the current year DR. R. B. PHILIP is serving in Dr. Humphrey's place at Queen's University.

Those who attended the Annual Meeting of the Canadian Psychological Association at Ottawa, or who read the Minutes, will recall that an impasse was reached in the selection of a President Elect. In the subsequent mail ballot, DR. J. S. A. BOIS of Montreal was elected to the post.

A number of staff changes are reported by Dr. R. B. MacLeod, Chairman of the Department of Psychology, McGill University. DR. DONALD O. HEBB has been appointed full Professor of Psychology and will take charge of the undergraduate and graduate work in Comparative and Physiological Psychology. Dr. Hebb has for some years been carrying on research at the Yerkes Laboratories of Primate Biology, Orange Park, Florida. DR. GEORGE A. FERGUSON has been appointed Assistant Professor of Psychology and will teach courses in Psychological Statistics, Experimental Psychology, and Mental Measurement. DR. FRANCES S. ALEXANDER has opened a private office at 1533 Mackay Street, Montreal. She will continue on the University staff on a part-time basis.

It is also reported that a new research laboratory for Experimental, Comparative, and Physiological Psychology is included in the plans for the Donner Building, at present under construction. It is expected that this will be ready for occupancy during the course of the current academic year.

PROFESSOR W. R. FRASER, who joined the staff of the University of Western Ontario in September, 1946, has gone to Sir George Williams College, Montreal, as Professor of Philosophy.

W. G. MANN returned from service with the Canadian Army and joined the Staff Department, Head Office, Bank of Montreal. He is now engaged in introducing personnel selection methods and psychological counselling.

J. R. SEELEY is being added to the staff of the National Committee for Mental Hygiene (Canada) as an executive officer. He will be engaged in the promotion of the national scheme for positive mental health for Canadian children, working particularly through the school systems.

DR. C. H. HAAGEN has been appointed Assistant Professor of Psychology in the University of Toronto. His interests centre around experimental psychology. During the war Dr. Haagen, a graduate of Iowa, did research work in communication in the Intelligence Branch of the United States Army. He comes to Toronto after a year in the University of Kansas.

DR. MOLLY HARROWER has been appointed Psychological Consultant to the United States Department of State, and Vice-Chairman of the Executive Committee of the Board of Governors of the International Committee for Mental Hygiene. Dr. Harrower is also the editor of a publication entitled *An American Lecture Series in Psychology*.